

Distribution of the Atlantic Bottlenose Dolphin (*Tursiops truncatus*) in the Chesapeake Bay Drainage in Virginia

Thomas F. Wilcox

Virginia Department of Game and Inland Fisheries
4010 West Broad Street
Richmond, VA 23230

Susan G. Barco & W. Mark Swingle

Virginia Marine Science Museum Stranding Program
717 General Booth Boulevard
Virginia Beach, VA 23451

INTRODUCTION

Coastal and estuarine Atlantic bottlenose dolphins (*Tursiops truncatus*) in Virginia are part of the coastal migratory stock listed as depleted under the Marine Mammal Protection Act (Wang et al., 1994). Live observations, strandings, and behavioral activity of bottlenose dolphins are well documented at the mouth of the Chesapeake Bay and along the southern coastline of Virginia (Blaylock, 1988; Barco, 1995); however, few data are available on occurrences in mainstem rivers and tributaries of the state. Bottlenose dolphins are known to occur in Virginia from April through November (Barco, 1995) and ascend into tributary rivers of the Chesapeake Bay, but only anecdotal data of bottlenose dolphin occurrences in rivers are available. Historically (pre-1900), bottlenose dolphins were observed 29 km downstream of Washington D.C. in the Potomac River and above the Aqueduct Bridge near Washington D.C. (Paradiso, 1969). More recent anecdotal data in Virginia indicate the presence of bottlenose dolphins in the Rappahannock River at Tappahannock, Cypress Swamp near Smithfield, Elizabeth River at Craney Island, and York River at Gloucester Point. In Florida, bottlenose dolphins are known to occur 120 km upstream in the St. Johns River (R. Wells, personal communication, Mote Marine Laboratory) and in the Indian/Banana estuarine system (Odell & Asper, 1990).

In 1995, a marine mammal management plan for Virginia, funded by the Virginia Coastal Program at

the Virginia Department of Environmental Quality, was completed by federal and state agencies, members of academia, and conservation organizations. The overall objective of the plan is to protect, manage, and enhance marine mammal populations and promote education, participation, and coordination in Virginia (Terwilliger & Musick, 1995). This study addressed three objectives under the 1995 management plan for marine mammals: (1) to describe the spatial distribution of bottlenose dolphins in the mainstem rivers and tributaries; (2) to establish observation programs; and (3) to improve public participation and interest. Similar comprehensive surveys and long term observation programs were conducted in Georgia and Maryland (Wang et al., 1994).

MATERIALS AND METHODS

Volunteers were recruited to record observations of bottlenose dolphins from May through October 1996 in tidal portions of river mainstems (James, York, Rappahannock, Potomac), mainstem tributaries, peninsula tributaries, and bay and oceanside areas of the Eastern Shore, Virginia. The primary observation group consisted of water quality monitors (WQM) representing the Alliance for the Chesapeake Bay who are responsible for weekly water quality monitoring at fixed locations throughout the Bay region. Topographic maps (1:24,000) were distributed to WQMs to develop ARC INFO/GIS coverages, and observation effort (minutes) was calculated for each WQM. Secondary (i.e. incidental)

observers consisted of volunteers and staff from river organizations, federal and state agencies, military installations, and private entities. These included Dahlgren Installation, Fort Belvoir, Fort Eustis, Mason Neck National Wildlife Refuge, Department of Conservation and Recreation-Division of State Parks, Department of Health-Division of Shellfish Sanitation, Virginia Marine Resources Commission-Law Enforcement, Virginia Institute of Marine Science, American Rover Sailing Vessel, The Bay Institute, Chesapeake Bay Foundation-York River Chapter, Christopher Newport University, Friends of the Elizabeth River, Surfrider Foundation, and Virginia Power. Survey forms were issued to WQM and incidental observers to record date, waterbody, location, dolphin abundance (maximum, minimum, estimate), and water quality parameters (salinity, temperature, tide period). Volunteer workshops were conducted by the Virginia Department of Game and Inland Fisheries, Richmond, Virginia, and the Virginia Marine Science Museum, Virginia Beach, Virginia, to educate participants on the biology and ecology of bottlenose dolphins, and survey protocols. Aerial surveys were conducted along mainstem rivers and peninsulas on 16 August and 20 September 1996 from 0800 to 1800 hours to augment land-based volunteer efforts (Fig. 1). A World Wide Web site (<http://www.vims.edu/cbner/teach/dolphome.htm>) was also developed to capture similar incidental data in 1997 using an electronic data sheet, and to provide long term observations.

RESULTS AND DISCUSSION

Forty-six WQMs and 15 incidental observer groups participated in the survey. One hundred and fifty-seven WQM reports were submitted at the end of the study period, representing a total effort of 63.5 hours. The greatest amount of effort and number of observations were in the Elizabeth ($n=10$) and Rappahannock ($n=10$) river systems. Based on the estimated number of individuals per observation, the average number of dolphins in a group was 14. Several small individuals were observed, indicating the presence of calves or subadults. Urbanna Creek, a tributary of the Rappahannock River, was the most upstream observation point of bottlenose dolphins in tidal mainstem river tributaries during the period of observation (Fig. 2). The most upstream point for mainstem river dolphin observation was at Stove Point along the Rappahannock River near Water View, Virginia.

We were unable to generate effort analyses (i.e., number of dolphins observed per hour of observation per area) for the WQM observers because so few observations were recorded ($n=3$). This may be attributable to the short duration of observation time (<5 minutes) and the fact that many water quality monitoring

stations were located outside bottlenose dolphin preferred habitat. We did not ask incidental observers to record effort because many observations were made while observers were participating in other activities (e.g., fishing, sailing, swimming).

Despite difficulties in calculating effort, these data provided the first recorded upper extent movements of bottlenose dolphin in mainstem rivers and tributaries. This information is being disseminated to wildlife managers, federal and state natural resource agencies, local planners, and schools. This study also provided an initial assessment of the effectiveness of volunteer observers to obtain dolphin sightings and determined that volunteers can be utilized in large scale distributional research. However, future studies should incorporate stationary boat-based observation stations where effort and area can be documented and compared among stations. Data generated from this type of study will allow delineation of relative abundance areas.

ACKNOWLEDGMENTS

This project was funded, in part, by the Virginia Coastal Resources Management Program at the Virginia Department of Environmental Quality through grant #NA47OZ0287-01 of the National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not reflect the views of NOAA or any of its subagencies. A special thanks to the Virginia Marine Science Museum and the Virginia Department of Game and Inland Fisheries for serving as the coordinating agencies, and to Marcy Judd, Citizen Monitoring Coordinator, Alliance for the Chesapeake Bay, Richmond, Virginia, for coordinating water quality monitor activities. We are also grateful to Zohra S. Haziq, Chesapeake Bay National Estuarine Research Reserve Center, Gloucester Point, Virginia, for the development of the World Wide Web page, Chris Mattson and Greg Harvey, Virginia Department of Game and Inland Fisheries, for map production, and all the observers for their participation.

LITERATURE CITED

- Barco, S. 1995. Population patterns of bottlenose dolphins (*Tursiops truncatus*) in the nearshore waters of Virginia Beach, Virginia. Master's Thesis, James Madison University, Harrisonburg, Virginia. 80 pp.
- Blaylock, R. 1988. The distribution and abundance of the bottlenose dolphin, *Tursiops truncatus* (Montagu, 1821), in Virginia. Fisheries Bulletin 86: 797-806.

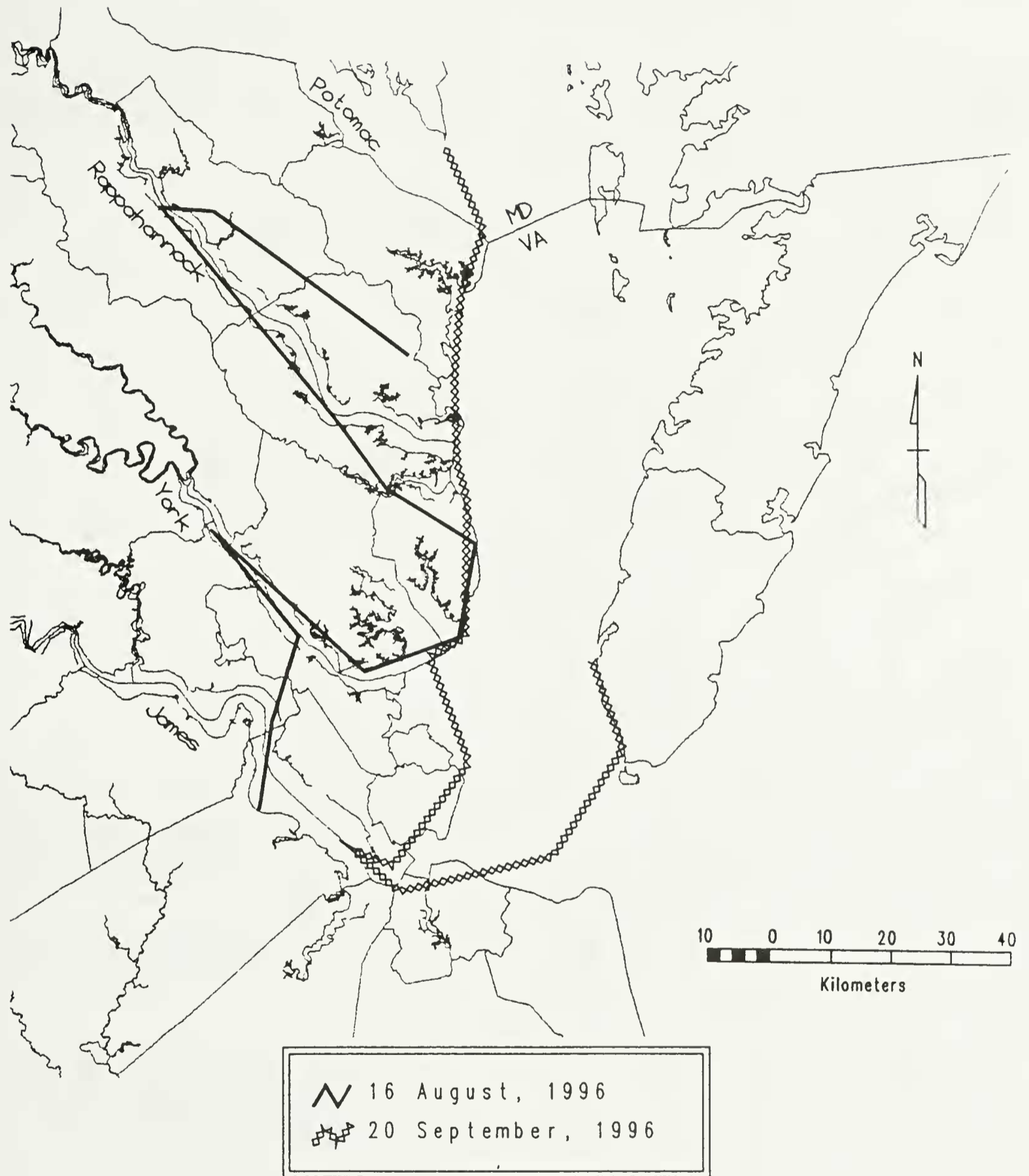


Fig. 1. Flight patterns on 16 August and 20 September 1996 in the Chesapeake Bay drainage in Virginia.

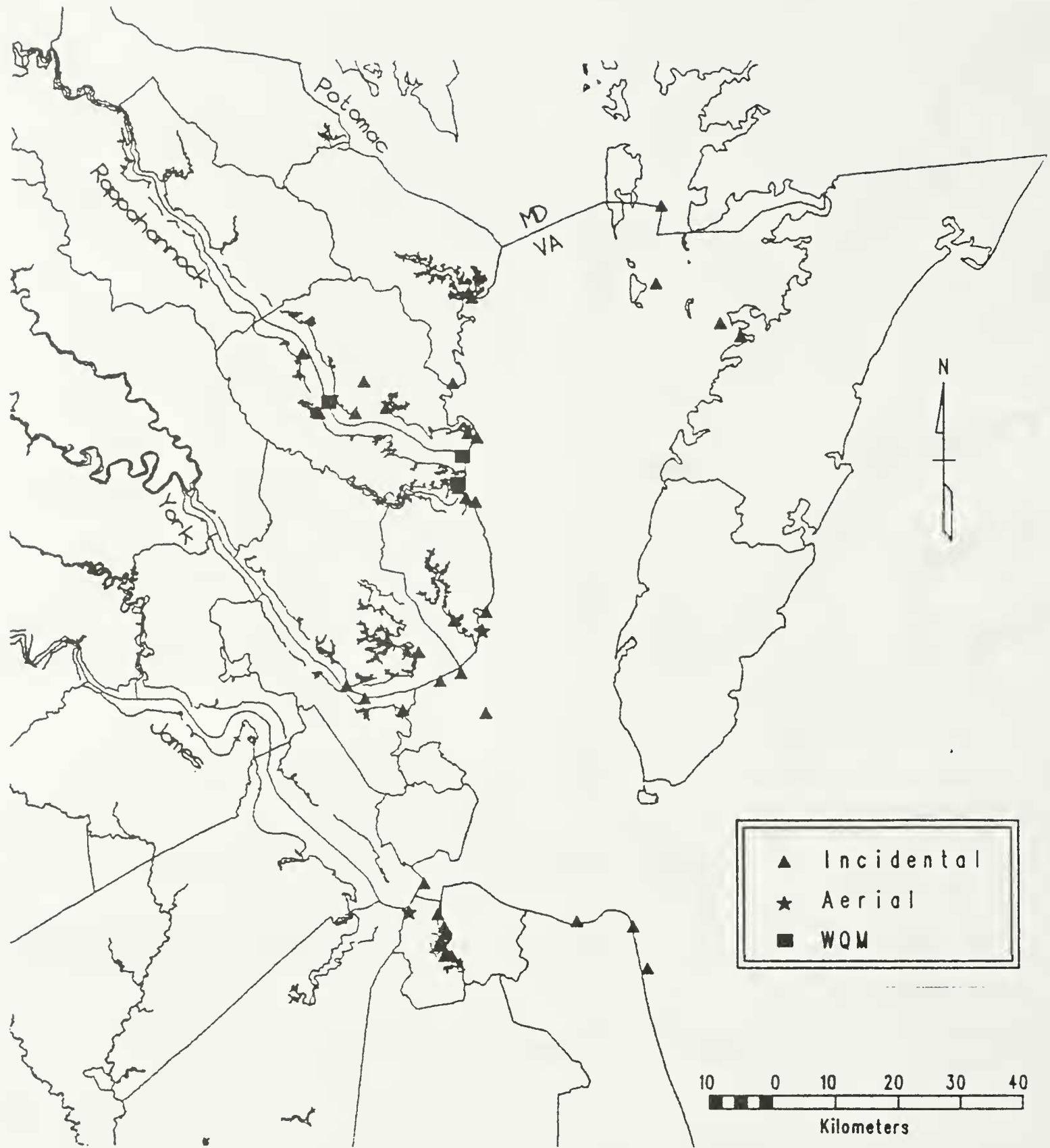


Fig. 2. Dolphin observations from May 1996 - November 1997 in the Chesapeake Bay drainage of Virginia.

Paradiso, J. L. 1969. Mammals of Maryland. North America Fauna #66. United States Department of the Interior, Washington, D.C. 193 pp.

Odell, D. & E. Asper. 1990. Distribution and movements of freeze-branded bottlenose dolphins in the Indian and Banana rivers, Florida. Pp. 515-540 *In* Leatherwood and Reeves (eds.), *The Bottlenose Dolphin*. Academic Press, New York.

Terwilliger, K. & J. Musick. 1995. Management Plan for Sea Turtles and Marine Mammals in Virginia. Final Report: National Oceanic and Atmospheric Administration, Washington, D.C. 56 pp.

Wang, K., P. Payne, & V. Thayer. (Compilers). 1994. Coastal stock(s) of Atlantic bottlenose dolphin: Status review and management. United States Department of Commerce, NOAA Technical Memorandum NMFS-OPR-4, Washington, D.C. 121 pp.

Banisteria. Number 11. 1998

© 1998 by the Virginia Natural History Society

The Virginia Piedmont Water-boatman *Sigara depressa* (Heteroptera: Corixidae) Rediscovered in Virginia

Christopher S. Hobson, Anne C. Chazal, and Steven M. Roble

Virginia Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street
Richmond, VA 23219

INTRODUCTION

The family Corixidae (Order Heteroptera) is cosmopolitan in distribution and specimens have been taken from every continent (Bobb, 1974). Commonly called water boatmen, these insects occupy a wide range of aquatic habitats, including pools, ponds, backwaters of streams, and occasionally slow-flowing streams. Most species live in fresh water but a few inhabit brackish waters. Corixids can be found in extreme abundance at some sites, often with several species found in the same habitat.

The Virginia Piedmont water-boatman (*Sigara depressa* Hungerford) is a poorly known member of the family Corixidae. Described by Hungerford (1948) on the basis of material collected in Fluvanna County in 1947 and 1948, it can be distinguished from other local species of *Sigara* by its color pattern and characteristics of the male palps and claspers. Adults overwinter in backwater pools of small streams and become active by March (Bobb, 1974).

This species is apparently endemic to Virginia (Polhemus et al., 1988; Hoffman, 1991). Its historical distribution includes only four sites (Fig. 1), all of

which are small streams in Virginia's Piedmont physiographic province (Caroline, Fluvanna, Hanover, and Prince William counties). Bobb (1974) stated that *S. depressa* has not been collected in Virginia since 1948, when he collected only a few specimens at the type locality, even though it was common at the same site during the previous year. His subsequent surveys at this site were unsuccessful. Bobb found this species at only one other locality (Campbell's Creek, Caroline County) despite his fairly intensive surveys for aquatic Heteroptera throughout Virginia. The most recent collections of *S. depressa* were made in 1969 when John T. Polhemus (personal communication) took it on 13 June in Prince William Forest Park (Prince William County) and J. Quensen found it on 3 July at County Route 658 along the North Anna River (Hanover County). One male specimen collected at the Prince William (county) site is currently retained in the J. T. Polhemus Collection, Colorado Entomological Museum, 3115 South York Street, Englewood, CO 80110. One male specimen from the Hanover County site is deposited in the entomology collection at the USNM (D. A. Polhemus, personal communication). Neither of these 1969 collection sites were mentioned by Bobb (1974) or